

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**

## FIG. 1

|    |                                                                         |       |       |       |       |       |
|----|-------------------------------------------------------------------------|-------|-------|-------|-------|-------|
| 5' | 9                                                                       | 18    | 27    | 36    | 45    | 54    |
|    | CAG CCC CGG GGC GCC GGC CGC GCG CAG CCT CGC TAT CCC ACC CAG GCT CCG GGC |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 63                                                                      | 72    | 81    | 90    | 99    | 108   |
|    | TTC CAG GAG GGT CGC GGA GCC CCA AGC CAT GAC TAA GGA GCC CAT TTG ATA GCA |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 117                                                                     | 126   | 135   | 144   | 153   | 162   |
|    | GAG GTG GCG CGC AGC CCG GCG AGC CGA TGA CGG ACC CCT TCT TCC TGC CTT CAA |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 171                                                                     | 180   | 189   | 198   | 207   | 216   |
|    | TGC CTC AGC GGA AGA TCC CCA AGG GCT GGA GCG AGG AGC GCT GCC GCT GGA CAT |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 225                                                                     | 234   | 243   | 252   | 261   | 270   |
|    | CCT CCC GGG GAG GCT GCT CCG ACC TGC TGC GCG GCG CGT CTG AGA CTG GGG ACT |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 279                                                                     | 288   | 297   | 306   | 315   | 324   |
|    | GAG CCA CTC CGC CGC CGG CGC CGC CGC CGC CGC CCG CTC CGT CGC TGC CGT     |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 333                                                                     | 342   | 351   | 360   | 369   | 378   |
|    | CGG TCT GGA CTG GCC CCC ACC TCG CTG CGC CCT CTC CCC GGC CCC GGC CCC GGC |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 387                                                                     | 396   | 405   | 414   | 423   | 432   |
|    | TCG GGG CGT CCC GGG GCT CGC CCT GCG ACC GCC GCC TCC CGC GCG CCG CGT CCT |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 441                                                                     | 450   | 459   | 468   | 477   | 486   |
|    | CCC GAC CCC GCG GCG GCG ACG ATG CCC GGG AGG AGG GTC CTG ACG GCG GCG GCG |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 495                                                                     | 504   | 513   | 522   | 531   | 540   |
|    | CGG ATG GTG GCG GCC GGC CGG GTG TGA TGC GAG CGT CAC GGT GGG GAT GCT     |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 549                                                                     | 558   | 567   | 576   | 585   | 594   |
|    | GCT GGC TGC GCG GCG CTG AGG GCC AGC GAG AGC GAG AGC CCG CCC GGG GCG GAG |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 603                                                                     | 612   | 621   | 630   | 639   | 648   |
|    | GAC GGA CTC ATC CGG ATC TGG CTG CAG CGT GGG CTC GGA GCT CCC CCT TCC TCT |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 657                                                                     | 666   | 675   | 684   | 693   | 702   |
|    | CGG TCT CCC TCT CGG CCC CCC TTT ATT TCC TTC TTG CTT TGC GTC TTT AAC ACC |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 711                                                                     | 720   | 729   | 738   | 747   | 756   |
|    | TCT CGA CCC TGT CCT CCC CCC GCC ACT GGA AGT CTT CCC GTC TCT AAA TGG AAT |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | 765                                                                     | 774   | 783   | 792   | 801   | 810   |
|    | TAG TGG AGC CCG GAG CCT CTG GTG TAA CGC ACA GAC ATG ATC CAT GGG CGC AGC |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | M I H G R S                                                             |       |       |       |       |       |
|    | 819                                                                     | 828   | 837   | 846   | 855   | 864   |
|    | GTG CTT CAC ATT GTA GCA AGT TTA ATC ATC CTC CAT TTG TCT GGG GCA ACC AAG |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | V L H I V A S L I I L H L S G A T K                                     |       |       |       |       |       |
|    | 873                                                                     | 882   | 891   | 900   | 909   | 918   |
|    | AAA GGA ACA GAA AAG CAA ACC ACC TCA GAA ACA CAG AAG TCA GTG CAG TGT GGA |       |       |       |       |       |
|    | -----                                                                   | ----- | ----- | ----- | ----- | ----- |
|    | K G T E K Q T T S E T Q K S V Q C G                                     |       |       |       |       |       |

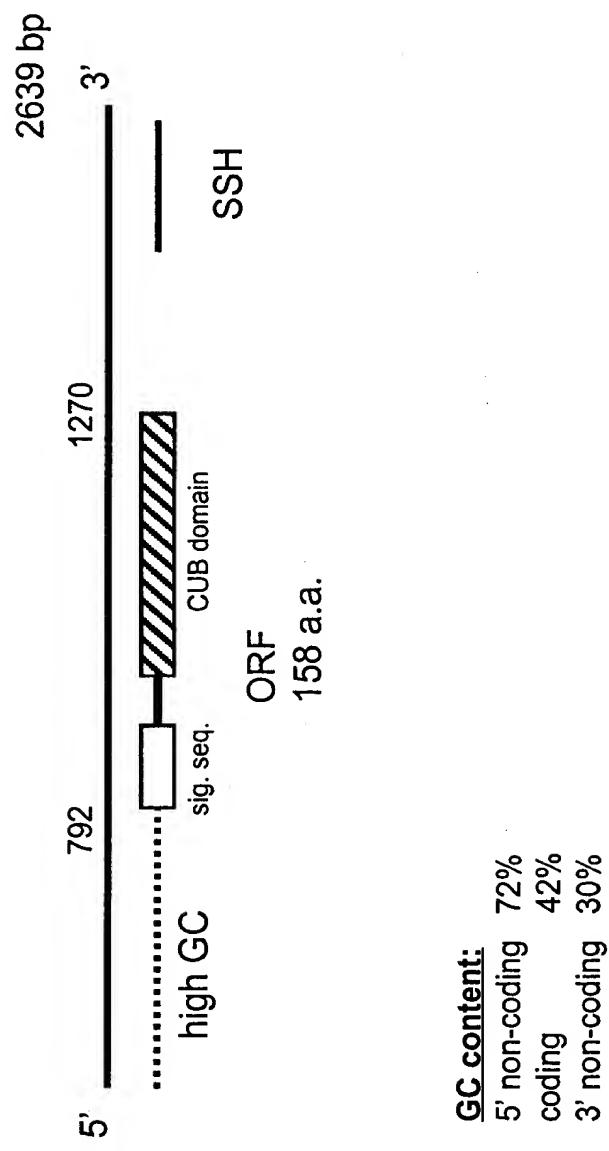
|                                                                         |      |      |      |      |      |
|-------------------------------------------------------------------------|------|------|------|------|------|
| 927                                                                     | 936  | 945  | 954  | 963  | 972  |
| ACT TGG ACA AAA CAT GCA GAG GGA GGT ATC TTT ACC TCT CCC AAC TAT CCC AGC |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| T                                                                       | W    | T    | K    | H    | A    |
| E                                                                       | G    | G    | I    | F    | T    |
| S                                                                       | P    | N    | Y    | P    | S    |
| -----                                                                   |      |      |      |      |      |
| 981                                                                     | 990  | 999  | 1008 | 1017 | 1026 |
| AAG TAT CCC CCT GAC CGG GAA TGC ATC TAC ATC ATA GAA GCC GCT CCA AGA CAG |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| K                                                                       | X    | P    | P    | D    | R    |
| E                                                                       | C    | I    | Y    | I    | E    |
| A                                                                       | A    | I    | E    | A    | P    |
| P                                                                       | R    | Q    |      |      |      |
| -----                                                                   |      |      |      |      |      |
| 1035                                                                    | 1044 | 1053 | 1062 | 1071 | 1080 |
| TGC ATT GAA CTT TAC TTT GAT GAA AAG TAC TCT ATT GAA CCG TCT TGG GAG TGC |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| C                                                                       | I    | E    | L    | Y    | F    |
| D                                                                       | E    | K    | Y    | S    | I    |
| E                                                                       | P    | S    | W    | E    | C    |
| -----                                                                   |      |      |      |      |      |
| 1089                                                                    | 1098 | 1107 | 1116 | 1125 | 1134 |
| AAA TTT GAT CAT ATT GAA GTT CGA GAT GGA CCT TTT GGC TTT TCT CCA ATA ATT |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| K                                                                       | F    | D    | H    | I    | E    |
| V                                                                       | R    | D    | G    | P    | F    |
| F                                                                       | G    | P    | F    | G    | F    |
| S                                                                       | P    | I    | S    | P    | I    |
| I                                                                       | I    |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| 1143                                                                    | 1152 | 1161 | 1170 | 1179 | 1188 |
| GGA CGT TTC TGT GGA CAA CAA AAT CCA CCT GTC ATA AAA TCC AGT GGA AGA TTT |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| G                                                                       | R    | F    | C    | G    | R    |
| Q                                                                       | Q    | O    | N    | P    | F    |
| O                                                                       | N    | P    | P    | V    | I    |
| N                                                                       | P    | V    | I    | K    | S    |
| P                                                                       | V    | I    | K    | S    | S    |
| V                                                                       | I    | K    | S    | S    | G    |
| I                                                                       | K    | S    | S    | G    | R    |
| S                                                                       | I    | S    | G    | R    | F    |
| -----                                                                   |      |      |      |      |      |
| 1197                                                                    | 1206 | 1215 | 1224 | 1233 | 1242 |
| CTA TGG ATT AAA TTT TTT GCT GAT GGA GAG CTG GAA TCT ATG GGA TTT TCA GCT |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| L                                                                       | W    | I    | K    | F    | A    |
| W                                                                       | I    | K    | F    | A    | D    |
| I                                                                       | K    | F    | A    | D    | G    |
| K                                                                       | F    | A    | D    | G    | E    |
| F                                                                       | A    | D    | G    | E    | L    |
| A                                                                       | D    | G    | E    | L    | E    |
| D                                                                       | G    | E    | L    | E    | S    |
| G                                                                       | E    | L    | E    | S    | M    |
| E                                                                       | L    | E    | S    | M    | G    |
| L                                                                       | E    | S    | M    | G    | F    |
| E                                                                       | S    | M    | G    | F    | S    |
| S                                                                       | M    | G    | F    | S    | A    |
| -----                                                                   |      |      |      |      |      |
| 1251                                                                    | 1260 | 1269 | 1278 | 1287 | 1296 |
| CGA TAC AAT TTC ACA CCT GGT AAG TAA GTA CTT AAA AAA AAA ATT TCT TTT TCT |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| R                                                                       | Y    | N    | F    | T    | P    |
| Y                                                                       | N    | F    | T    | P    | G    |
| N                                                                       | F    | T    | P    | G    | K    |
| F                                                                       | T    | P    | G    | K    | *    |
| -----                                                                   |      |      |      |      |      |
| 1305                                                                    | 1314 | 1323 | 1332 | 1341 | 1350 |
| TCC TCA TTT TTC TAT CTT CAT AGT ACA AAA TCT TGT GTA AGA CAA CAT TAT ACT |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| 1359                                                                    | 1368 | 1377 | 1386 | 1395 | 1404 |
| TTC TCA GAG AAT GTT CCA GTT CTA TTT AAA ACC AAA TCT ACA GTG CTT TTT CTT |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| 1413                                                                    | 1422 | 1431 | 1440 | 1449 | 1458 |
| TTC CCT ACA CAA ATT CTG AAA GGA AAA GAT GTT TTC CTT AAA ACA GCC TAT ACT |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| 1467                                                                    | 1476 | 1485 | 1494 | 1503 | 1512 |
| AGA GGT AAA GAG TAG TGA CTC AAG GCT CTA ATT GGG CAT CAG CCA CAT CAT CAA |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| 1521                                                                    | 1530 | 1539 | 1548 | 1557 | 1566 |
| GTG GAC TTT TGT TAT GAT GGA ATG TGT AAT TGG AGA GAC AGT CTG TGA TAA GGA |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| 1575                                                                    | 1584 | 1593 | 1602 | 1611 | 1620 |
| AAC TAT ACA TAG GAG CTG AAT AAA CTT GAA AAG ACA ATT GTA GTA TTA TAA AAT |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| 1629                                                                    | 1638 | 1647 | 1656 | 1665 | 1674 |
| ATA TCC ACC AAA ATG ATC TTT GGG GAA CTT GAA TCA AAA GTT TAT TTG TTC TGA |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| 1683                                                                    | 1692 | 1701 | 1710 | 1719 | 1728 |
| AAA TTA CCG TGT TTC AAT CAA ATA GAT CCT ACT TTA GGA AGT AGT CTG CTC TCT |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |
| 1737                                                                    | 1746 | 1755 | 1764 | 1773 | 1782 |
| TTT CAG GAA AGC AAA TTC TTA AGA GTT TTG ATG AAA GGA AAA CTG AGA CCT GTA |      |      |      |      |      |
| -----                                                                   |      |      |      |      |      |

TOP SECRET//COMINT

| 1791  | 1800  | 1809  | 1818  | 1827  | 1836  |
|-------|-------|-------|-------|-------|-------|
| ACA   | GCC   | AAA   | TAC   | TCA   | TTT   |
| ACA   | AGG   | TCT   | TGC   | AGA   | AAT   |
| TGT   | CAT   | ATA   | CGA   | TGT   | CAA   |
| TTA   | TCA   | TCA   | ATA   | TTA   | TCA   |
| AAT   | AAT   | AAT   | AAT   | AAT   | AAT   |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 1845  | 1854  | 1863  | 1872  | 1881  | 1890  |
| TAT   | GCA   | ATC   | TGT   | ATC   | AAT   |
| ATC   | TGT   | ATC   | AAT   | TTT   | CCT   |
| TTT   | CCT   | TTT   | AAC   | TCG   | CTA   |
| AGA   | GGT   | AA    | TCG   | GAA   | TTA   |
| TGA   | TTA   | AGA   | TTA   | AAA   | AGA   |
| 1899  | 1908  | 1917  | 1926  | 1935  | 1944  |
| GTT   | GCC   | TGG   | CCC   | ACT   | TGA   |
| CCC   | ACT   | TGA   | TTA   | AGA   | GTT   |
| ACT   | TGA   | TTA   | AGA   | GTT   | ACC   |
| TTA   | AGT   | ACC   | ATT   | CAT   | TAC   |
| AGT   | AAT   | AAA   | AAA   | AAT   | AAT   |
| AGG   | AGG   | AGG   | AGG   | AGG   | AGG   |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 1953  | 1962  | 1971  | 1980  | 1989  | 1998  |
| TTA   | TCA   | CAT   | TTT   | TTC   | ACT   |
| TTC   | ACT   | GCA   | AGA   | ACA   | ACA   |
| GCA   | AGA   | ACA   | CTA   | CAT   | GCA   |
| CTA   | CAT   | CAT   | TTA   | ATT   | TAA   |
| CAT   | ATT   | ATT   | ATT   | ATG   | GAA   |
| AAA   | AAA   | AAA   | AAA   | AAA   | AAA   |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 2007  | 2016  | 2025  | 2034  | 2043  | 2052  |
| TGA   | TTC   | AAA   | TTA   | CAT   | AAA   |
| AAA   | TTA   | CAT   | AAA   | GCC   | CAT   |
| GCC   | CAT   | TTT   | TTA   | TAT   | AGT   |
| CAT   | TTT   | TTA   | TAT   | TTG   | TTT   |
| TAT   | TCA   | GTT   | TAT   | TCA   | GTT   |
| TGT   | AGT   | AGG   | AAA   | AGT   | TGT   |
| TTG   | TTG   | CAA   | TAG   | CAT   | ATG   |
| CAA   | TAA   | TAT   | AAT   | AAA   | AGT   |
| TAG   | AGG   | AAA   | TTG   | AAA   | TGG   |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 2061  | 2070  | 2079  | 2088  | 2097  | 2106  |
| TAT   | TGT   | TTT   | ATT   | TAA   | GTT   |
| TTT   | ATT   | TAA   | GTT   | AGG   | CAA   |
| ATT   | GTT   | AGG   | CAA   | TAG   | CAT   |
| TAA   | AGG   | CAA   | TAG   | CAT   | AAT   |
| GTT   | AGG   | CAA   | TTC   | AAA   | TAC   |
| CAA   | AGG   | CAA   | TCT   | AAA   | TAC   |
| AGC   | AGC   | AGA   | TAA   | TAC   | AGC   |
| TTG   | TTG   | AAA   | TAA   | AAA   | TAC   |
| ACT   | ACT   | AAA   | TAA   | AAA   | TAC   |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 2115  | 2124  | 2133  | 2142  | 2151  | 2160  |
| TTG   | AAG   | TTT   | GTA   | TTC   | CAT   |
| TTT   | GTA   | TTC   | CAT   | GTT   | AAA   |
| GTA   | AAA   | AAA   | GAA   | GTA   | ACA   |
| AAA   | AAA   | AAA   | GAA   | ACA   | TCT   |
| GAA   | AAA   | AAA   | GAA   | ACA   | AAA   |
| TTG   | TTG   | AAA   | GAA   | ACA   | TAC   |
| ACT   | ACT   | AAA   | GAA   | ACA   | TAC   |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 2169  | 2178  | 2187  | 2196  | 2205  | 2214  |
| CAG   | TTA   | AAA   | AAC   | TAA   | AAT   |
| AAA   | AAC   | TAA   | AAT   | TTT   | AAA   |
| AAC   | TAA   | AAT   | TTT   | AAA   | AAT   |
| TAA   | AAT   | TTT   | AAA   | AAT   | TTT   |
| AAT   | TAA   | TTT   | AAA   | AAT   | TTT   |
| GAC   | TAA   | TTT   | AAA   | AAT   | TTT   |
| TTT   | AAA   | TTT   | AAA   | AAT   | TTT   |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 2223  | 2232  | 2241  | 2250  | 2259  | 2268  |
| CAT   | TAT   | GAC   | ATC   | ATG   | GGG   |
| TAT   | GTT   | AAA   | TCA   | AGT   | ATT   |
| GAC   | ATC   | ATG   | GGG   | TGT   | AGT   |
| ATC   | ATG   | GGG   | TAT   | TGT   | AGC   |
| GGG   | AGT   | AGT   | ATT   | AGC   | ATA   |
| AGC   | ATA   | AGT   | TAT   | TGT   | TAT   |
| ATA   | TAT   | AGT   | ATT   | AGC   | TAT   |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 2277  | 2286  | 2295  | 2304  | 2313  | 2322  |
| AGC   | TTT   | AAG   | CAT   | TTG   | GAA   |
| TTT   | AAG   | CAT   | TTG   | TAA   | TAA   |
| AAG   | CAT   | TTG   | TAA   | TAT   | TAT   |
| CAT   | TTG   | TTT   | TAA   | TAA   | TAT   |
| TTG   | TTT   | TTT   | TAA   | TAA   | TAT   |
| GAA   | TTT   | TTT   | TAA   | TAA   | TAT   |
| TTA   | TTT   | TTT   | TAA   | TAA   | TAT   |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 2331  | 2340  | 2349  | 2358  | 2367  | 2376  |
| ATT   | ATG   | CTT   | TGC   | TGA   | TAA   |
| ATG   | CTT   | TGC   | TGA   | TGG   | ATT   |
| CTT   | CTT   | TGC   | TGA   | TGG   | ATT   |
| TGC   | TGC   | TGA   | TAA   | TGG   | ATT   |
| TGA   | TGA   | TAA   | TGG   | TAT   | TTC   |
| TAA   | TAA   | TGG   | TAT   | TTC   | ATG   |
| TGG   | TGG   | ATT   | ACT   | CAC   | TGC   |
| ATT   | ATT   | ACT   | ACT   | CAC   | TGC   |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 2385  | 2394  | 2403  | 2412  | 2421  | 2430  |
| TAC   | AGT   | CGA   | ACT   | AAT   | TTG   |
| AGT   | CGA   | ACT   | AAT   | TTG   | AAG   |
| CGA   | ACT   | AAT   | TTG   | AAG   | TAT   |
| ACT   | TTG   | AAG   | TAT   | TCC   | CAA   |
| TTG   | AAG   | TAT   | TCC   | CAA   | AAG   |
| AAG   | TAT   | TCC   | CAA   | AGT   | CAA   |
| TAT   | TCC   | CAA   | AGT   | CAA   | ATG   |
| TCC   | CAA   | AGT   | CAA   | ATG   | TTC   |
| CAA   | AGT   | CAA   | ATG   | TTC   | TTA   |
| AGT   | CAA   | ATG   | TTC   | TTA   | GCT   |
| CAA   | ATG   | TTC   | TTA   | GCT   | TAA   |
| ATG   | TTC   | TTA   | GCT   | TAA   | TTT   |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 2439  | 2448  | 2457  | 2466  | 2475  | 2484  |
| GTT   | TGT   | TCA   | GAT   | TAT   | TAT   |
| TGT   | TCA   | GAT   | TAT   | TAT   | TAT   |
| TCA   | GAT   | TAT   | TAT   | TAT   | TAT   |
| GAT   | TAT   | TAT   | TAT   | TAT   | TAT   |
| TAT   | TAT   | TAT   | TAT   | TAT   | TAT   |
| TAT   | TAT   | TAT   | TAT   | TAT   | TAT   |
| TAT   | TAT   | TAT   | TAT   | TAT   | TAT   |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 2493  | 2502  | 2511  | 2520  | 2529  | 2538  |
| CTT   | AAC   | TGA   | TAA   | TTT   | TGA   |
| AAC   | TGA   | TAA   | TTT   | TGA   | ATA   |
| TGA   | TAA   | TTT   | TGA   | ATA   | TAA   |
| TAA   | TTT   | TGA   | ATA   | TAA   | CCT   |
| TTT   | TGA   | ATA   | TAA   | CCT   | GCT   |
| TGA   | ATA   | TAA   | CCT   | GCT   | AGT   |
| ATA   | TAA   | CCT   | GCT   | AGT   | GAC   |
| TAA   | CCT   | GCT   | AGT   | GAC   | ATA   |
| CCT   | GCT   | AGT   | GAC   | ATA   | CGG   |
| GCT   | AGT   | GAC   | ATA   | CGG   | CAT   |
| AGT   | GAC   | ATA   | CGG   | CAT   | ----- |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 2547  | 2556  | 2565  | 2574  | 2583  | 2592  |
| GTT   | CTA   | GGT   | TTC   | ATA   | AGT   |
| CTA   | GGT   | TTC   | ATA   | AGT   | TAT   |
| GGT   | TTC   | ATA   | AGT   | TAT   | ATT   |
| TTC   | ATA   | AGT   | TAT   | ATT   | TTC   |
| ATA   | AGT   | TAT   | ATT   | TTC   | GGT   |
| AGT   | TAT   | ATT   | TTC   | GGT   | TTG   |
| TAT   | ATT   | TTC   | GGT   | TTG   | GTG   |
| ATT   | TTC   | GGT   | TTG   | GTG   | ATC   |
| TTC   | GGT   | TTG   | GTG   | ATC   | ATG   |
| GGT   | TTG   | GTG   | ATC   | ATG   | AAA   |
| TTG   | GTG   | ATC   | ATG   | AAA   | ATA   |
| GTG   | ATC   | ATG   | AAA   | ATA   | ----- |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 2601  | 2610  | 2619  | 2628  | 2637  | 2646  |
| ATG   | TCT   | TGG   | ATT   | TAA   | AA    |
| TCT   | TGG   | ATT   | TAA   | AAT   | AA    |
| TGG   | ATT   | TAA   | AAT   | TGT   | GGT   |
| ATT   | TAA   | AAT   | TGT   | GGT   | TTC   |
| TAA   | AAT   | TGT   | GGT   | TTC   | ACA   |
| AAT   | TGT   | GGT   | TTC   | ACA   | AAA   |
| TGT   | GGT   | TTC   | ACA   | AAA   | AAA   |
| GGT   | TTC   | ACA   | AAA   | AAA   | AAA   |
| TTC   | ACA   | AAA   | AAA   | AAA   | AAA   |
| ACA   | AAA   | AAA   | AAA   | AAA   | AAA   |
| AAA   | AAA   | AAA   | AAA   | AAA   | AAA   |
| AA    | AA    | AA    | AA    | AA    | AA    |
| 3'    | 3'    | 3'    | 3'    | 3'    | 3'    |

T C T T G G G G G G G G G G

**FIG. 2**



# FIG. 3

A

43.5% identity in 115 residues overlap

|            |    |                                                                 |
|------------|----|-----------------------------------------------------------------|
| BPC-1      | 33 | IFTSPNYP SKYPPDREC IYII EAAPRQ CIEL YFDEKYSIEPSW-----ECKFDHIEVR |
| CUB domain | 75 | IFTSPNFPDRYPPN IDCVRVIHSRPQHDVVVKFHVF HIESTYDKIDAGEEC PND FIEFR |

\*\*\*\*\* \* \*\*\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

|            |     |                                                               |
|------------|-----|---------------------------------------------------------------|
| BPC-1      | 86  | DGPFGFSPII GRCGQQNPP -VIKSSGRFLWI KFFADGELES MGFSARY NFTPGK   |
| CUB domain | 135 | DGRYGFSP LIARFCGDRMPKREIRAVSGFLWIRFRSDSM LEYQGFS AEA YAI VPSK |

\*\*\* \* \*\*\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

B

35.3% identity in 102 residues overlap in CUB domain 1 of BMP-1

|       |     |                                                                   |
|-------|-----|-------------------------------------------------------------------|
| BPC-1 | 130 | GIFTSPNYP SKYPPDREC IYII EAAPRQ CIEL YFDEKYSIEPSWECKFDHIEVRDGPF G |
| BMP-1 | 336 | GNFSSPEYPNGYSAHMHCVWRISVT PGEKIILNFTSM-DLYRSRLCWYDYVEVRDGFWRK     |

\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

|       |     |                                                   |
|-------|-----|---------------------------------------------------|
| BPC-1 | 190 | SPIIGRFGC QQNPPVIKSSGRFLWI KFFADGELES MGFSARY     |
| BMP-1 | 395 | VWVRGRFCGGKLPEP I VSTD SRLW VEF RSSSNWVGKGF FA VY |

\*\*\*\*\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

39.4% identity in 104 residues overlap in CUB domain 2 of BMP-1

|       |     |                                                                     |
|-------|-----|---------------------------------------------------------------------|
| BPC-1 | 128 | EGGIFTSPNYP SKYPPDREC IYII EAAPRQ CIEL YFDEKYSIEPSWECKFDHIEVRDGPF   |
| BMP-1 | 447 | DNGHIQS PNP YPDDYRPSKVC I WRI QSEG FHVG LTF-QSFEIERHDSCAYDYLEVRDGHS |

\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

|       |     |                                                 |
|-------|-----|-------------------------------------------------|
| BPC-1 | 188 | GFSPIIGRFGC QQNPPVIKSSGRFLWI KFFADGELES MGFSARY |
| BMP-1 | 506 | ESSNLIGRYCGYENPDDIKSTSSRLWLKPVSDGSINKAGFAVN F   |

\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

36.3% identity in 102 residues overlap in CUB domain 3 of BMP-1

|       |     |                                                                   |
|-------|-----|-------------------------------------------------------------------|
| BPC-1 | 130 | GIFTSPNYP SKYPPDREC IYII EAAPRQ CIEL YFDEKYSIEPSWECKFDHIEVRDGPF G |
| BMP-1 | 605 | GSITSPGWPK EYPPNKNCIWQLVAPTQYRISLQFDF-FETEGNDVCKYDFV EVRSGLTAD    |

\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

|       |     |                                               |
|-------|-----|-----------------------------------------------|
| BPC-1 | 190 | SPIIGRFGC QQNPPVIKSSGRFLWI KFFADGELES MGFSARY |
| BMP-1 | 664 | SKLHGKFCGSEKPEVITSQYNNMRVEFKSDNTVSKKGFKAH F   |

\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

37.9% identity in 103 residues overlap in CUB domain 4 of BMP-1

|       |     |                                                                   |
|-------|-----|-------------------------------------------------------------------|
| BPC-1 | 130 | GIFTSPNYP SKYPPDREC IYII EAAPRQ CIEL YFDEKYSIEPSWECKFDHIEVRDGPF G |
| BMP-1 | 761 | GTITSPNWPDKYPSKKECTWAISSTPGRVKLT FVEM-DIESQPECAYDHLEVFDGRDAK      |

\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

|       |     |                                                |
|-------|-----|------------------------------------------------|
| BPC-1 | 190 | SPIIGRFGC QQNPPVIKSSGRFLWI KFFADGELES MGFSARYN |
| BMP-1 | 820 | APVLGRFCGSKKPEPVLATGNRMFLRFYSDNSVQRKG FQASHS   |

\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

32.3% identity in 96 residues overlap in CUB domain 5 of BMP-1

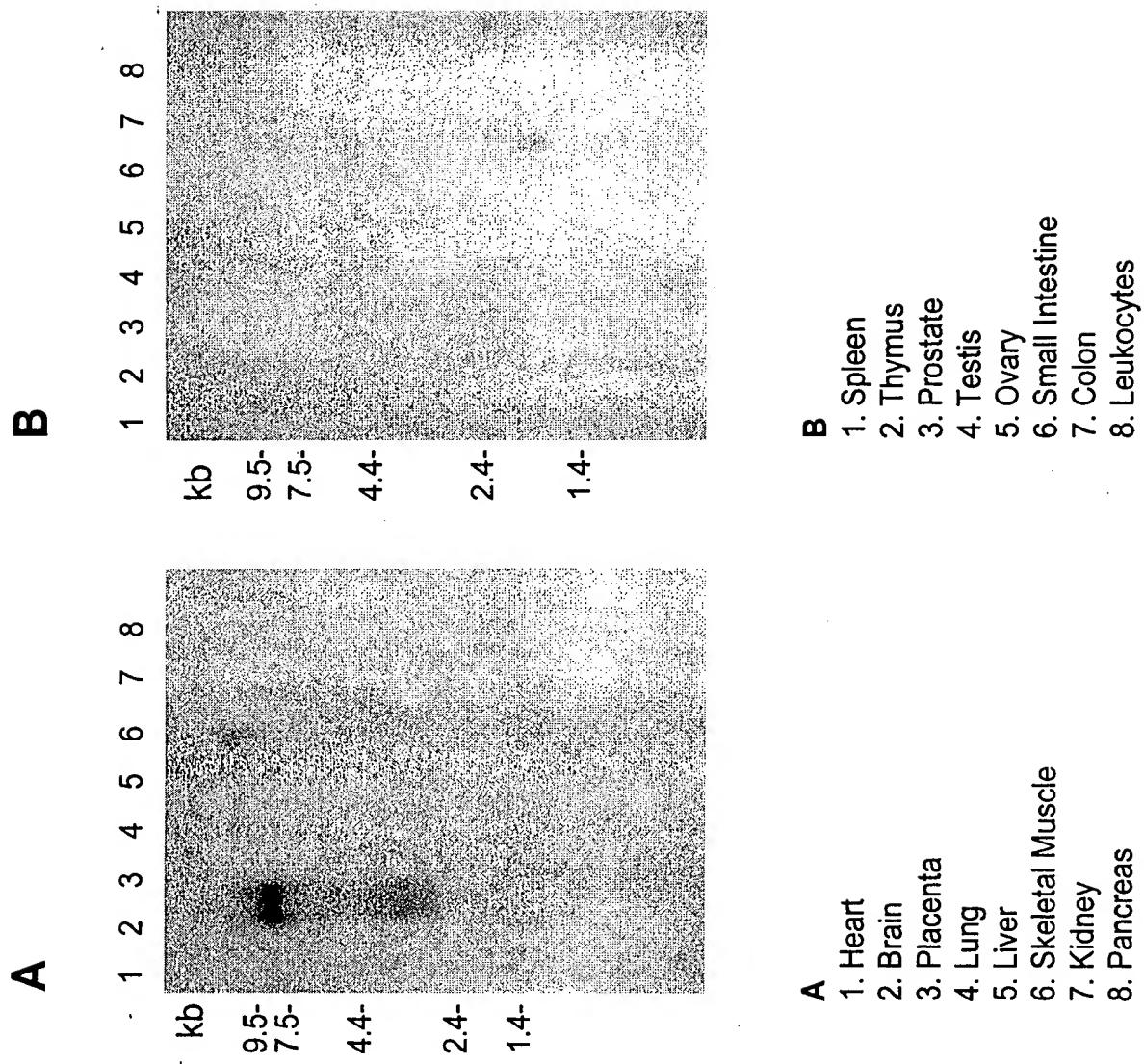
|       |     |                                                                   |
|-------|-----|-------------------------------------------------------------------|
| BPC-1 | 139 | SKYPPDREC IYII EAAPRQ CIEL YFDEKYSIEPSWECKFDHIEVRDGPF GFSPIIGRFGC |
| BMP-1 | 887 | NNYPGGVDCEWVIVAE EG YGVELVF-QT FEEVEEETDCGYDYIELFDGYDSTA PRLGRYCG |

\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

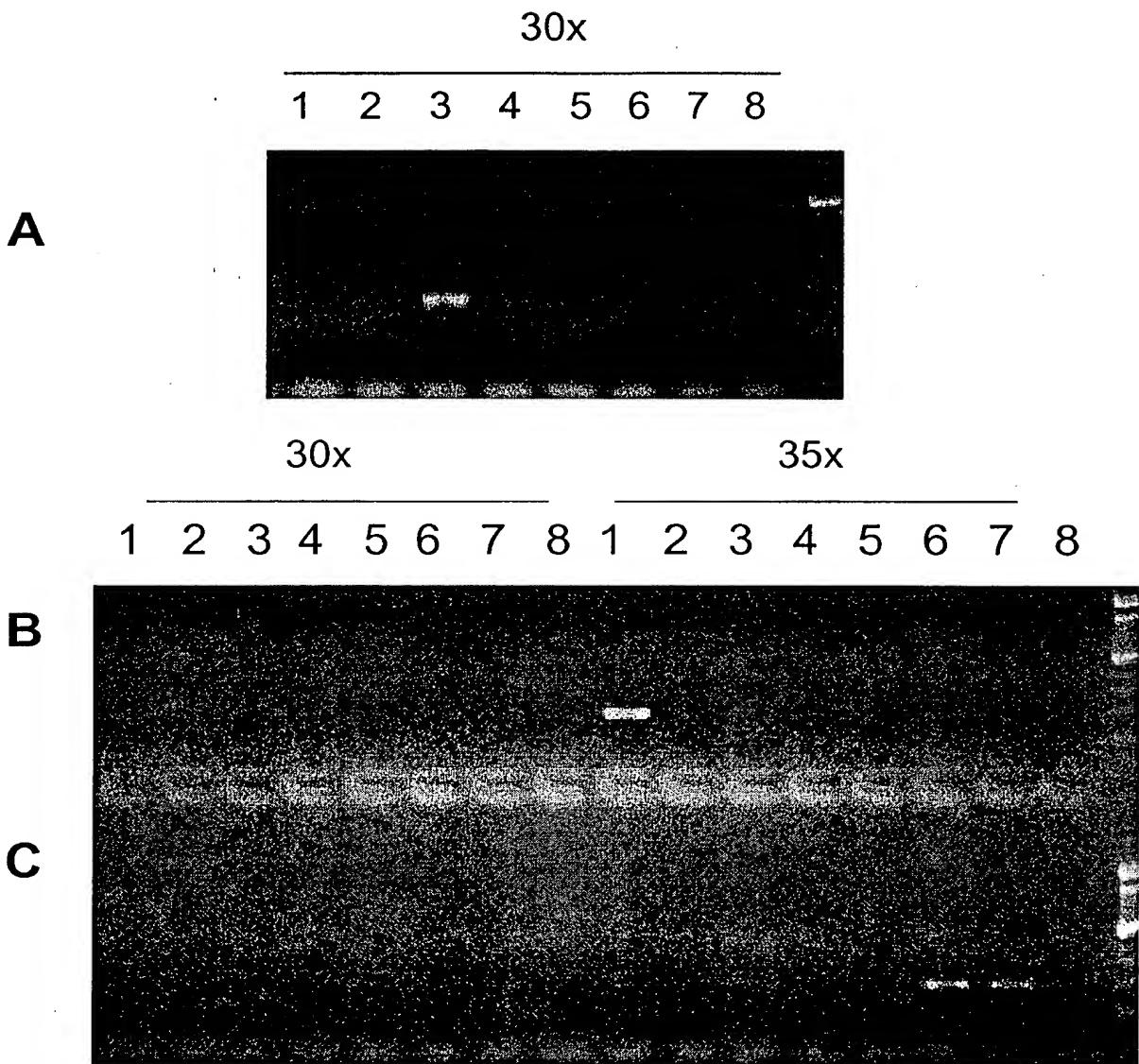
|       |     |                                          |
|-------|-----|------------------------------------------|
| BPC-1 | 199 | QQNPPVIKSSGRFLWI KFFADGELES MGFSARY NFT  |
| BMP-1 | 946 | SGPPEEVY SAGDSV LVKFHSDDTISKKG FHL RYTST |

\* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

FIG. 4



**FIG. 5**



**Panels:**

**A**

1. Brain
2. Prostate
3. LAPC-4 AD
4. LAPC-4 AI
5. LAPC-9 AD
6. HeLa
7. Murine cDNA
8. Neg. control

**B**

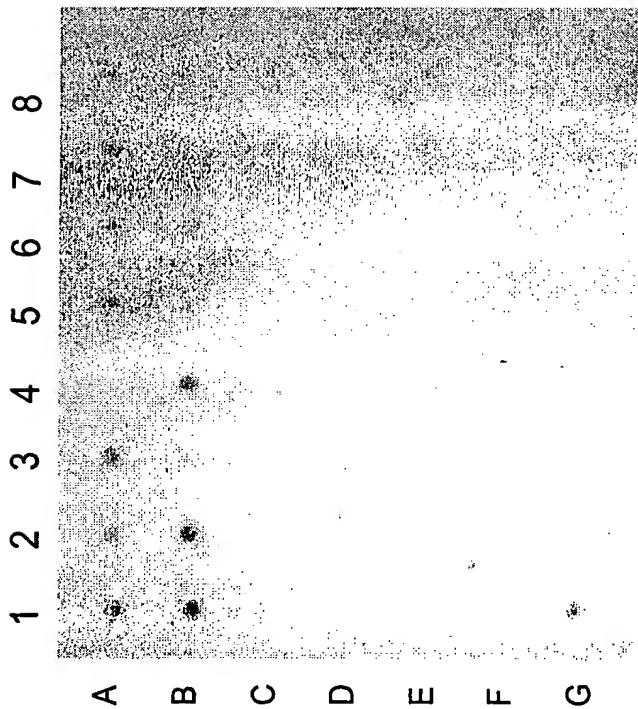
1. Brain
2. Heart
3. Kidney
4. Liver
5. Lung
6. Pancreas
7. Placenta
8. Skeletal Muscle

**C**

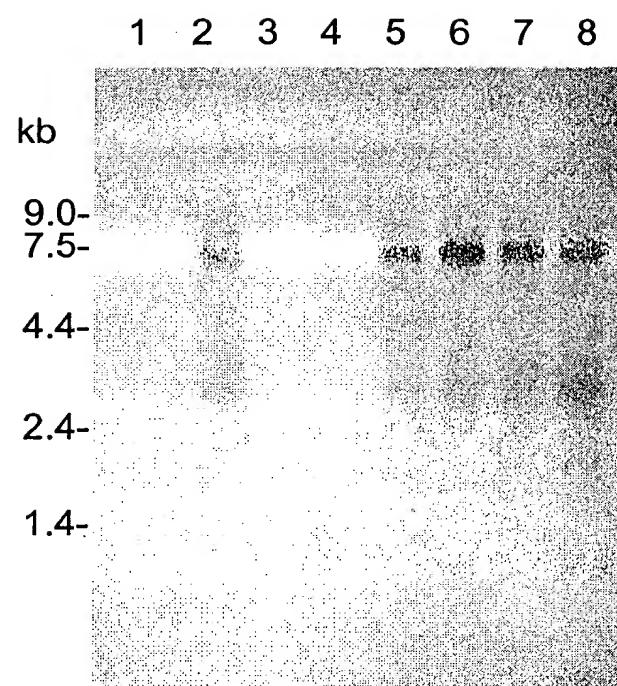
1. Colon
2. Ovary
3. Leukocytes
4. Prostate
5. Small Intestine
6. Spleen
7. Testis
8. Thymus

TOOTAGD-E6559260

**FIG. 6**



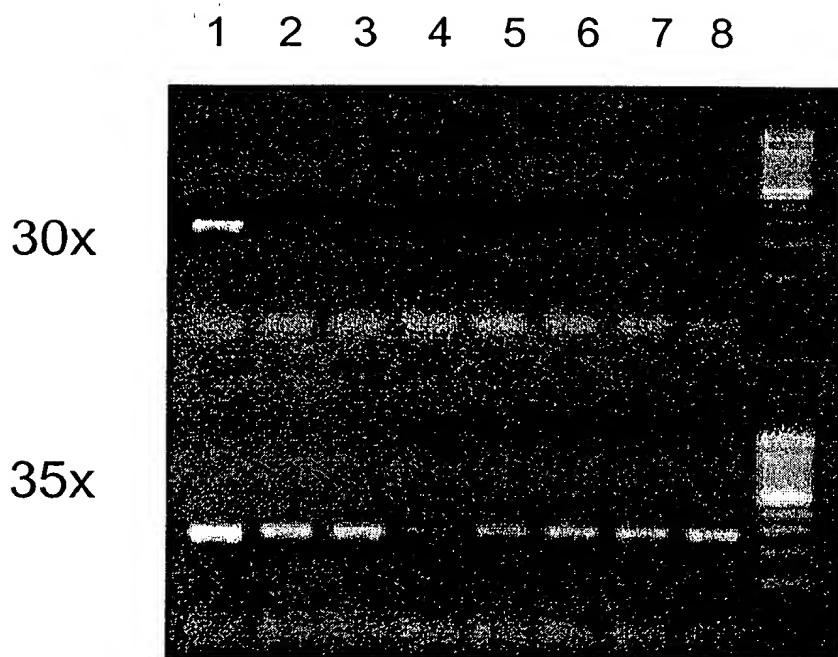
**FIG. 7**



**Lanes:**

1. Cerebellum
2. Cerebral Cortex
3. Medulla
4. Spinal Cord
5. Occipital Lobe
6. Frontal Lobe
7. Temporal Lobe
8. Putamen

# **FIG. 8**

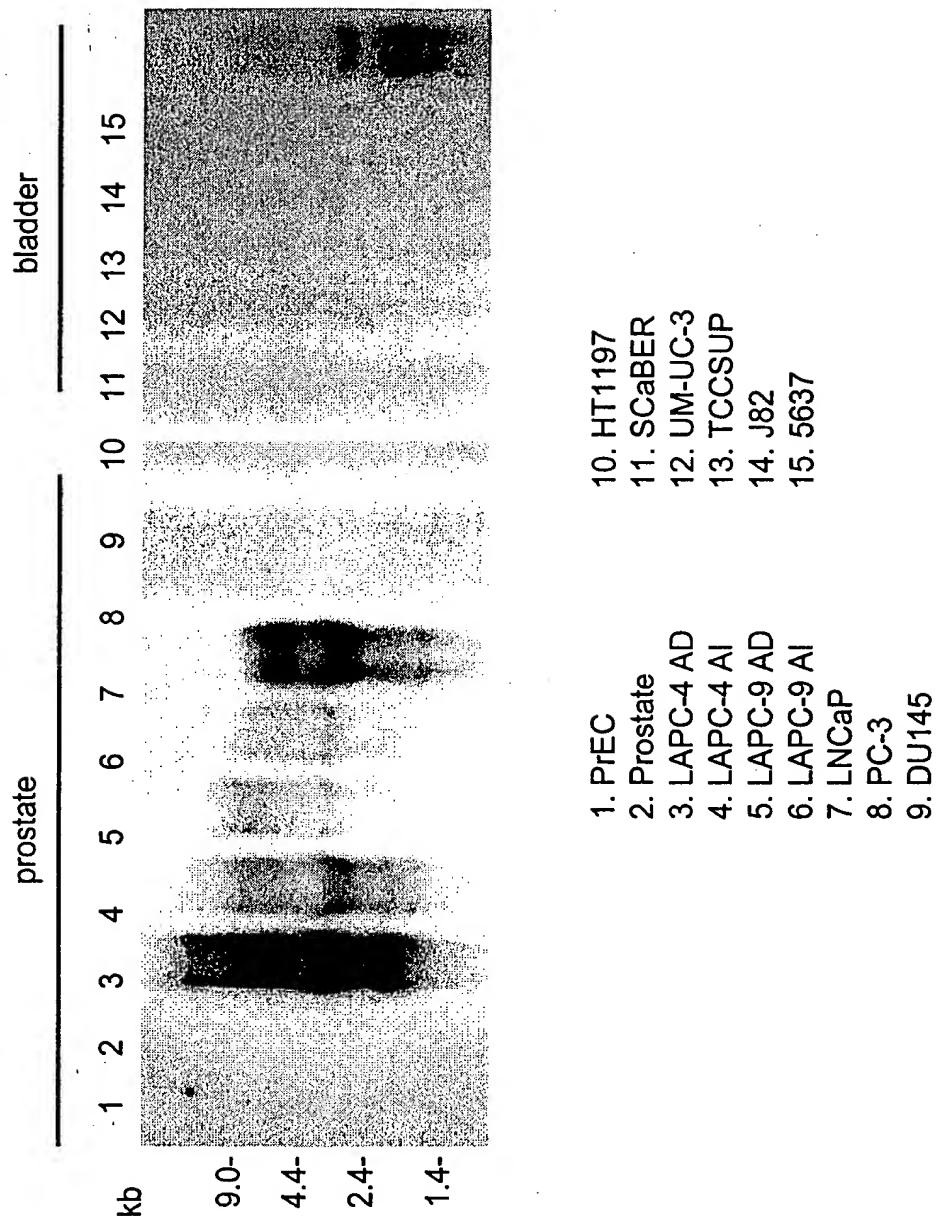


## **Panel:**

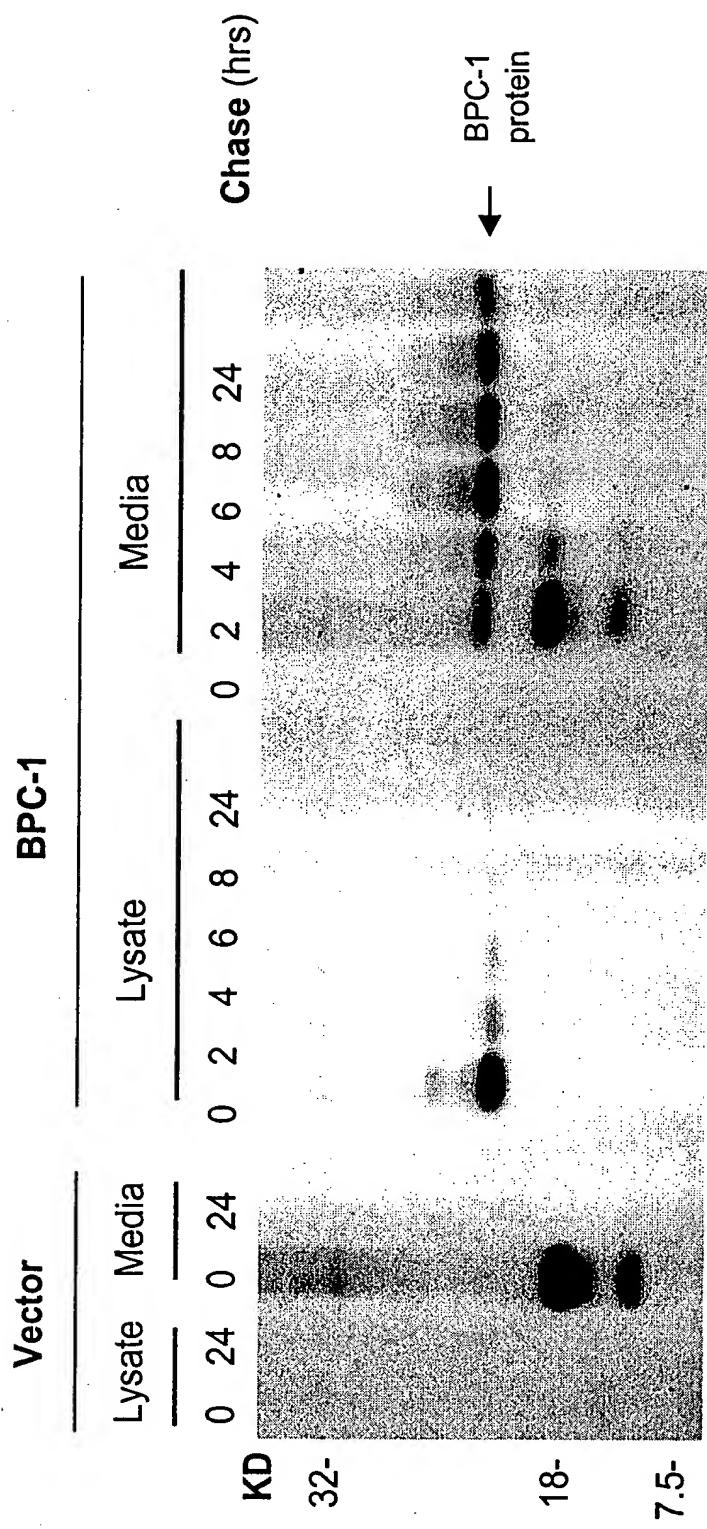
1. Brain
2. Heart
3. Kidney
4. Liver
5. Lung
6. Skeletal Muscle
7. Spleen
8. Thymus

00000000000000000000000000000000

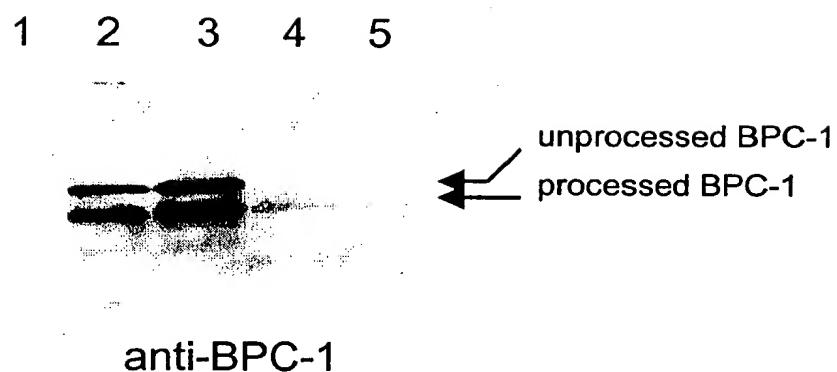
**FIG. 9**



**FIG. 10**



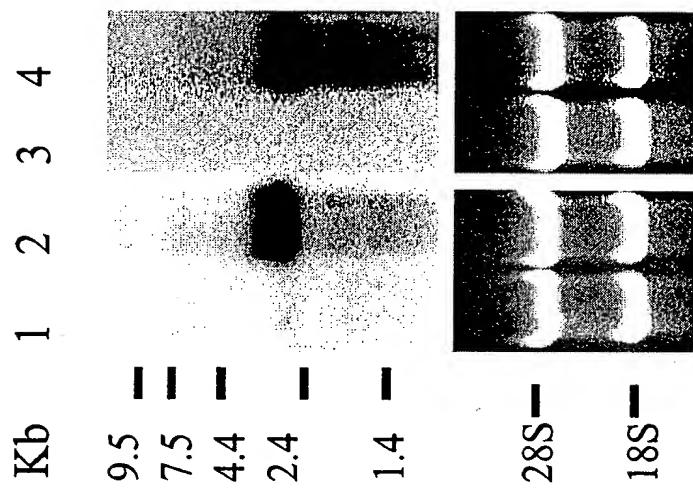
**FIG. 11**



**Lanes:**

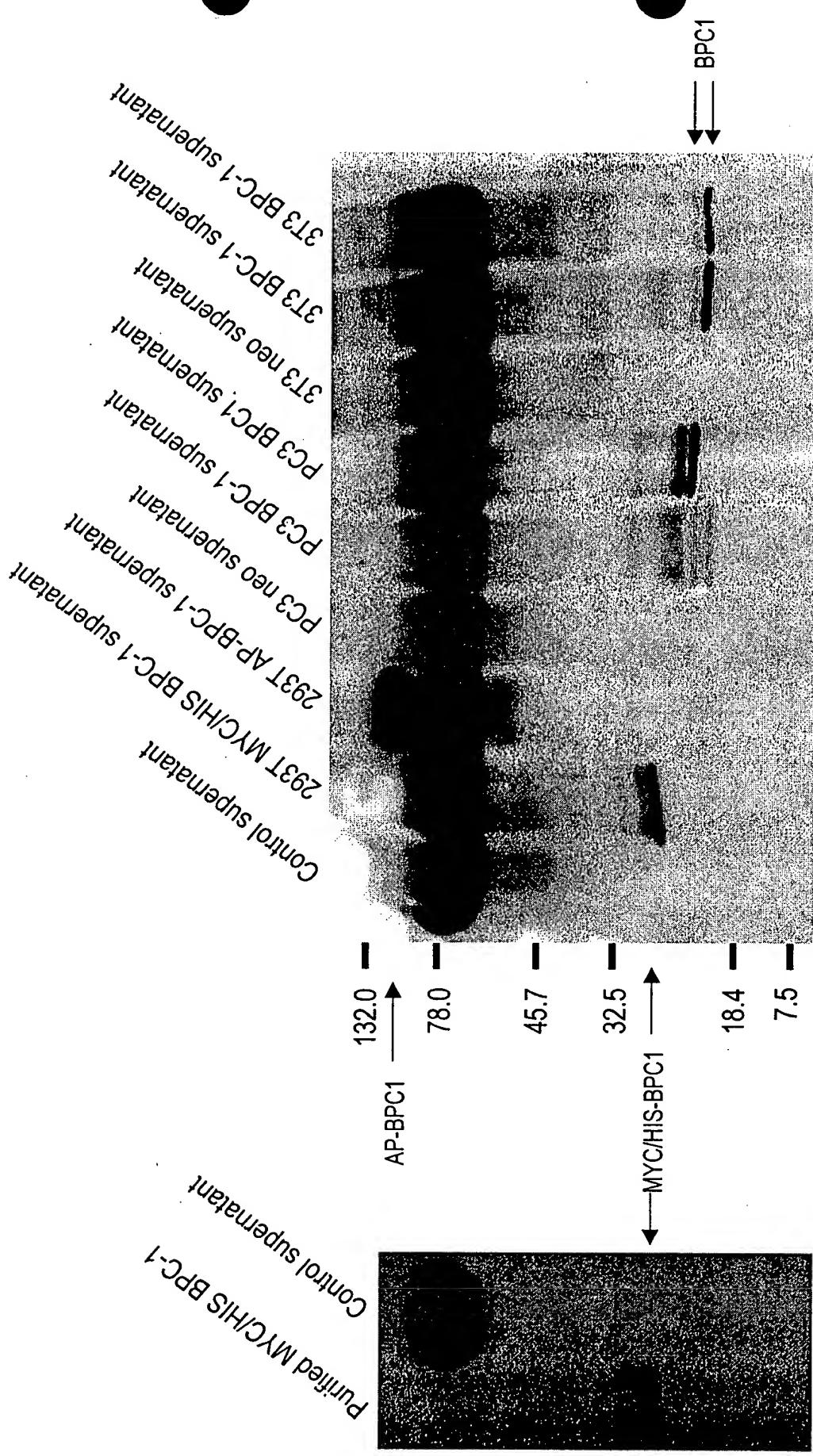
1. HighFive cell extract- uninfected
2. HighFive cell extract- infected with BPC-1 virus
3. HighFive cell extract - infected with BPC-1 virus
4. HighFive cell media - infected with BPC-1 virus
5. HighFive cell media - infected with BPC-1 virus

**FIG. 12**

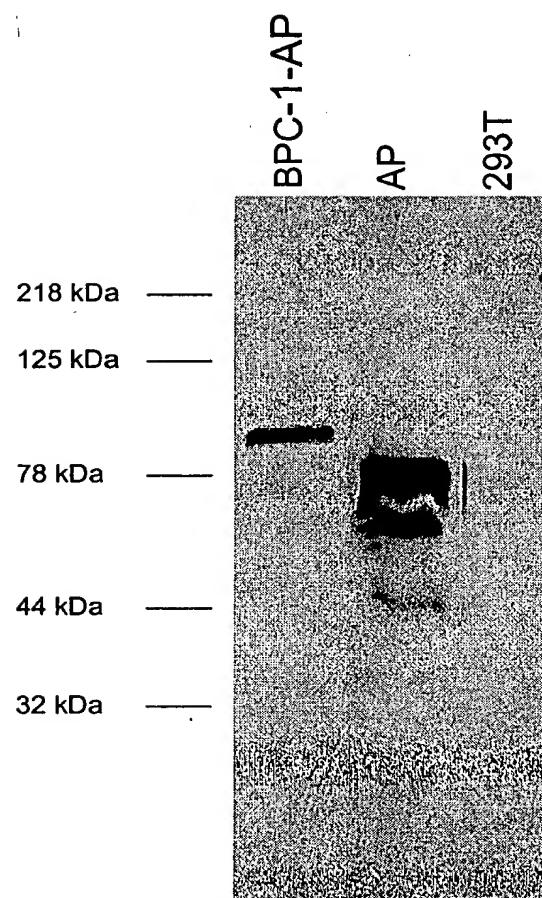


1. PC3/neo
2. PC3/BPC-1
3. 3T3CL7/neo, acute infection
4. 3T3CL7/BPC-1, acute infection

**FIG. 13**

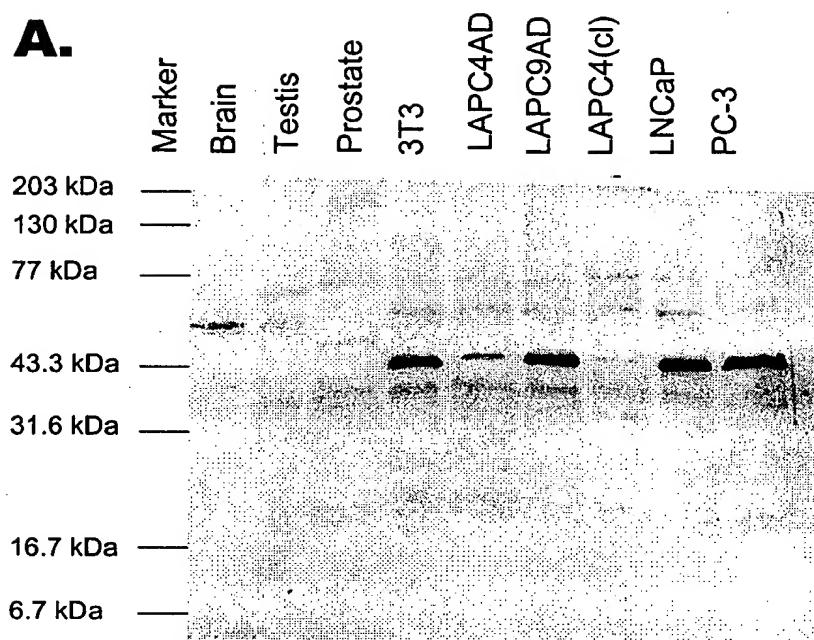


**FIG. 14**



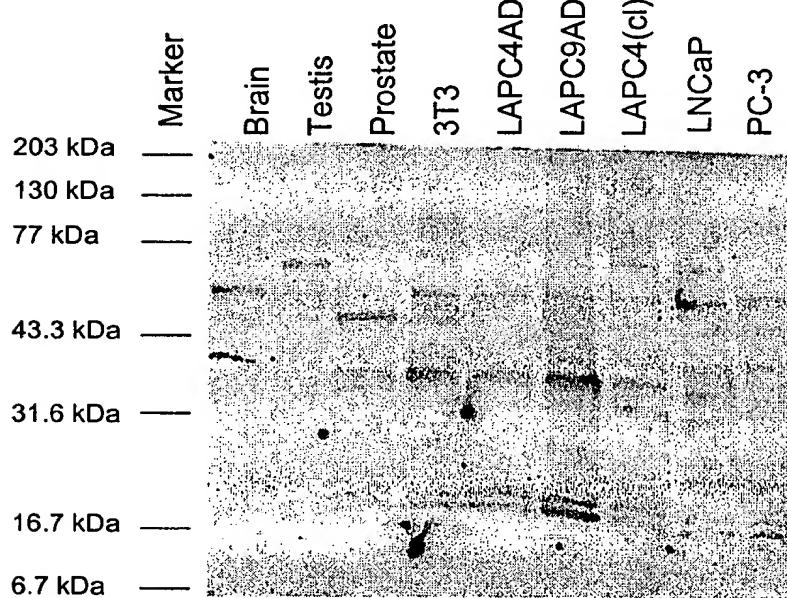
**FIG. 15**

**A.**



**BPC-1-AP  
Conditioned Media**

**B.**



**Alkaline Phosphatase  
Conditioned Media**